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Marine safety and pollution prevention from oil spills in the Arabian Gulf : a comparative study of applicable international and regional conventions

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Marine Safety and Pollution Prevention from Oil Spills in the Arabian Gulf:

A Comparative Study of Applicable International and Regional Conventions

By

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Declaration

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

Signature: _____

Date: 24-09-2019

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Co-supervisor: Dr. Tafsir Johansson

Institution/Organization: World Maritime University

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Abstract

Title of Dissertation**: Marine Safety and Pollution Prevention from Oil Spills in the Arabian Gulf: A Comparative Study of Applicable International and Regional Conventions**

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The protection of the marine environment has been one of humanity's biggest challenges since the turn of the 20th century. The problem of marine pollution is one that affects the whole world mainly because the marine pollution knows no bounds. Pollution in one country has the potential of negatively impacting the biodiversity of another country. Increased human activities such as the exploration of offshore and onshore also means that pollution in one country may negatively impact shared marine resources.

As such, prevention of marine pollution has been a subject of international laws and conventions. To the global community, it is apparent that the current level of pollution requires concerted efforts if gains are to be realized. There are also fears that the current levels of pollution can render the planet uninhabitable in the near future. In case pollution occurs, countries follow the tenets and precedents set by international conventions and laws to determine fault and to institute preventive measures.

To aid the investigation of the key issues surrounding marine pollution in the Arabian Gulf, this paper conducts a comparative study between the Arabian Gulf and the North Sea. Although both regions share similar circumstances in matters surrounding marine pollution, there seems to be better cooperation among states in the North Sea region. Unlike the Arabian Gulf, the region has also witnessed minimal instances of intentional pollution. Most countries are signatory to international law and conventions including those in the Arabian Gulf. One key convention is the United Nations 2030 Agenda for Sustainable Development Goal

14 that is part of the 17 SDGs formulated by the United Nations. SDG 14 recognizes the sustainable use of oceans, seas, and other scarce marine resources. These conventions also underscore the importance of partnership and cooperation among states.

In particular, this study analyses marine pollution in the Arabian Gulf and reviews the applicability of international laws and conventions. Like all other countries bound by international law, any form of pollution that occurs in the Arabian Gulf is subject to international maritime laws and conventions. Today, the laws that are developed to safeguard the marine environment are not only preventive but are also punitive. Moreover, the development of modern law of the sea and environmental law have led to the emergence of innovative legal instruments that can help countries efficiently utilize marine resources.

Like all types of international law, international marine law is comprised of treaties, conventions, and customary law. All of these sources of law provide a source for continued progress against marine pollution. However, the future of marine conservation depends on the willingness of these states to cooperate and enforce the conservation laws, treaties, and agreements.

Keywords: marine environment, biodiversity, Arabian Gulf, international law, conventions, agreements, SDG 14, oil pollution.

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List of Abbreviations

UN	United Nations
CLC Convention	International Convention for Civil Liability for Oil Pollution Damage, 1969
ICJ	International Court of Justice
IMO	International Maritime Organization
IMCO	Intergovernmental Maritime Consultative Organization
ILC	International Law Commission
SDG 14	Sustainable Development Goal 14
MEPC	Marine Environment Protection Committee
NSOAF	North Sea Offshore Authority Forum
MARPOL	International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978
OILPOL	International Convention for the Prevention of Pollution of the Sea by Oil
SOLAS	International Convention for the Safety of Life at Sea, 1974
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea, 1982
CAMRE	Council of Arab Ministers Responsible for Environment
OPRC	Convention the International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990

TPH	Total Petroleum Hydrocarbons
ROPME	Regional Organization for the Protection of the Marine Environmental
EMSA	European Maritime Safety Agency
CSN	CleanSeaNet
MANCHEPLAN	Anglo-French maritime emergency plan
AIS	Automatic Identification System
CEPCO	Coordinated Extended Pollution Control Operation
IMP	Integrated Maritime Policy
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
ROWA	United Nations Environment Programme Regional Office for West Asia
RESCO	Regional Clean Sea Organization
MEMAC	Marine Emergency Mutual Aid Centre
KAP	Kuwait Action Plan
VECs	Valued Ecosystem Components

Definition of Terms

Harmful Substances- In the context of this research, harmful substance refers to any contaminants introduced to the ocean. Harmful substances create hazards that are harmful to humans and the marine ecosystem. Any substance that is controlled by the SDG 14 is also categorised as a harmful substance.

Pollution- Pollution is defined as an adverse event which occurs when contaminants are introduced to the environment. Pollution may occur through air, water, or on land.

Marine Pollution- Marine pollution is defined as the introduction of harmful contaminants into the marine environment. Marine pollution is mostly caused by man and can occur directly or indirectly.

Administration- Unless stated otherwise, administration, in the context of this paper, is used to refer to the country whose authority is used to operate a ship.

Transboundary pollution- transboundary pollution is pollution that occurs when pollution in one country crosses to another country.

Public International Law- sometimes referred to as the law of nations, transboundary pollution is defined as the collection of rules, laws, principles, and regulations which govern the conduct of countries amongst themselves.

1 Chapter 1: Introduction

This chapter aims to introduce to the readers the general picture of the research by providing relevant background information on the subject matter. This will be followed by the description of the existing gaps in the previous related extant research and also provide the limitation of the research. And importantly, the objectives and questions of the research will be adequately outlined.

1.1 Subject Matter and Background

Pollution is defined as the process of making the natural environment unsafe for use. Pollution occurs in a wide range of ways but is primarily as a result of the introduction of contaminants to the natural ecosystem (Spellman, 2017). Contaminants may be tangible or intangible. Tangible contaminants are those that can be touched such as electronic waste, plastics, and oil spills. Electronic wastes are discarded or obsolete electronic devices and materials. Electronic wastes include used computers and mobile phones (Spellman, 2017). Intangible contaminants may be things like smoke, air, and light. Marine pollution, as the name suggest, occurs when contaminants are introduced to the marine ecosystem (Vikas & Dwarakish, 2015). Marine pollution may affect one country or may be transboundary in nature, which means more than one country is affected.

In the Arabian Gulf, oil pollution is a major form of marine pollution. Since the discovery of oil and subsequent export activities, the region has suffered tremendously from preventable activities associated with oil such as dredging, loading of oil, emptying of ballast tanks, exploration, prospecting, and manufacturing. Moreover, there have been a lot of oil pollution incidents from collision, explosions, and installation of oil exploration devices. The Arabian Gulf has also been associated with deliberate attacks as a result of armed conflict. For instance, the Kuwait Oil spill during the Gulf War. The oil spill had an extensive impact on marine ecology, public health, terrestrial ecology, and air quality. The effect of oil spills continue to be acknowledged, owing

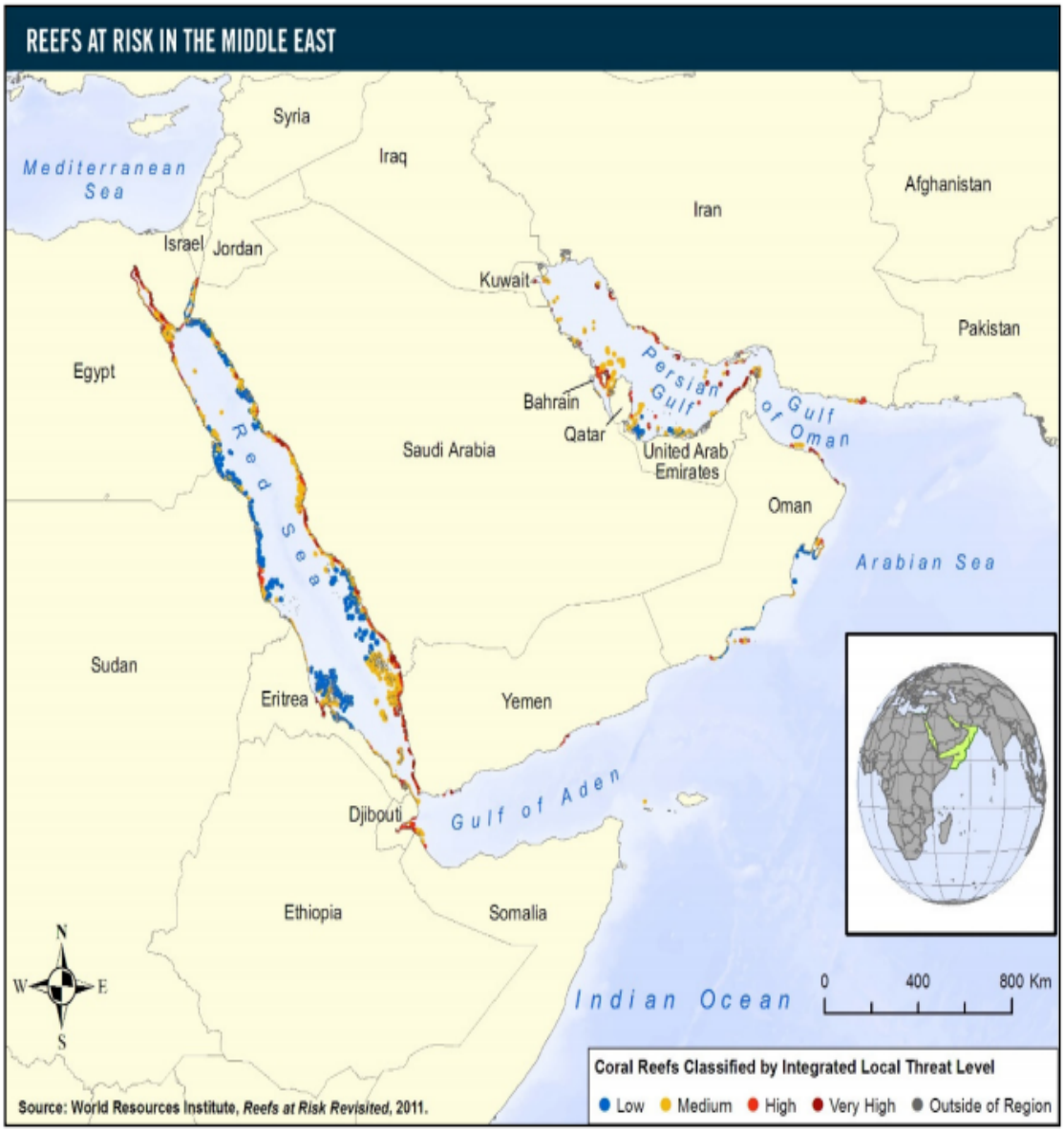
to the fact that spills have had a huge economic impact in the form of loss of productivity and infrastructural damage.

The Arabian Gulf is a transnational area in the Middle East. Apart from being a shared territory of local countries, the Arabian Gulf sits in a region, which is of enormous strategic and economic significance. The area has, thus, received huge international attention (Legrenzi & Lawson, 2017). Locally, the Arabian Gulf region includes Qatar, Oman, Bahrain, United Arab Emirates, Kuwait, and Saudi Arabia. All countries that are part of the Arabian Gulf have huge crude oil reserves and are renowned exporters of petroleum products. This makes the area prone to marine pollution. For decades, the most common form of pollution in the Arabian Gulf has been a mix of intentional and unintentional oil pollution.

This has primarily been because of anthropogenic activities. An oil spill is defined as the release of any form of petroleum product (crude oil, diesel, or gasoline) on land, in water, or air. Oil spills affect the air through emission of contaminated gases into the air of surrounding countries. Oil production and transportation is prone to leaks of volatile oil vapours (Fowler, 1993). In the Arabian Gulf, oil spills have primarily emanated from oil tankers, offshore and onshore drilling activities, and from pipeline leakages.

The Arabian Gulf is home to sensitive and unique marine wildlife. For instance, the region has a number of unique fish species supported by an extensive coral reef (Issa & Vempatti, 2018). Other species include migratory birds, mangroves, and Green and Hawksbill Turtles. Pollution in the Arabian Gulf particularly poses a risk on coral reefs (Shraim et al., 2017). As illustrated in figure 1, the coral reefs are under pressure from both oil pollution and extensive fishing. Coastal development also poses a risk on coral reefs in the Arabian Gulf. According to the World Resources Institute, over 85% of the coral reefs in the Arabian Gulf are threatened.

Figure 1 Coral Reefs at Risk in the Middle East



Source: (Shraim et al., 2017)

Because of the shared location of the Arabian Gulf, pollution caused by one country is bound to affect the other countries in one way or another. This can happen when contaminants introduced by one country crosses to the international border of another country. Oil pollution in the Arabian Gulf is a particularly contentious issue since the effects and the by-products of oil pollution and particulate matter have the ability to

cross international borders. For this reason, the issue concerned with marine oil pollution has been a subject of both national and international legal interest.

Oceans, lakes, and seas are crucial for the proper functioning of the global ecosystem. Apart from providing a livelihood to billions of people, oceans are home to millions of planetary species and marine animals. Even though oceans offer significant environmental benefits, their existence is increasingly facing threats from a wide range of human activities, such as marine pollution from oil spills, physical alterations of beaches, and uncontrolled mineral extraction. The threats faced by oceans have been a major international concern for global leaders and international bodies like the UN (United Nations) (Carpenter, 2011). The UN has developed Sustainable Development Goals (SDGs) (2015-2030) (Sosa-Nunez, 2017). The Ocean SDG (SDG 14) includes targets related to the conservation and sustainable use of oceans, seas, and marine resources.

Moreover, SDG 14 recognises the importance of ocean sustainability and pollution prevention (Takano, 2017). The objective of SDG 14 is to eliminate marine pollution and to protect the biodiversity of coastal and marine ecosystems. In line with the International Maritime Organisation's (IMO) Technical Cooperation Committee (2017), SDG 14 can improve the understanding and implementation of international laws and conventions, such as the 1973 International Convention for the Prevention of Pollution from Ships (MARPOL), the International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL) of 1954, and the United Nations Convention on the Law of the Sea (UNCLOS).

In recent years, there have been rafts of new treaties and agreements that have diversified the legal environment surrounding the use of marine resources. For instance, SDG 14 serves as an essential reference to the international responsibility against international marine pollution (Nathan, 2017). A number of local and international treaties have also been agreed upon by different countries with the objective of safeguarding the marine environment against pollution. This research investigates the extent of oil pollution in the Arabian Gulf and analyses applicable international laws and con-

ventions. In particular, the thesis uses SDG 14 as a frame of reference. Because international marine laws have existed for decades, this research also analyses the complications in enforcing marine laws, especially those aimed at safeguarding against oil spillage.

In line with the issues discussed above, the dissertation seeks to analyse the state of marine pollution in the Arabian Gulf with the aim to satisfy SDG 14. Another key legislation that has been adopted by the UN is the United Nations Convention on the Law of the Sea UNCLOS. Adopted in 1982, the goal of UNCLOS is was to protect the Ocean and the sea against marine pollution. UNCLOS has been particularly crucial in protecting against irresponsible ocean usage. Some of the landmark issues that UNCLOS has helped resolve are;

- Navigation rights;
- Transnational sea boundaries;
- Economic zones creation;
- Establishment of the International Seabed Authority;
- Creation of conflict-resolution mechanisms such as the UN Commission on the Limits of the Continental Shelf;

UNCLOS was adopted in December 1982 with after 14 years of work between over 150 countries representing every continent in the world. The convention embodies a raft of international rules that govern the use of oceans and seas. In addition, the convention introduced legal instruments with new obligations for nations and states. Most importantly, the convention created avenues and frameworks that could be used to develop laws of the sea against specific forms of marine pollution. In particular, the convention led to the development of international law that governs the use of public and international waters.

In November 1964, UNCLOS entered into force as an object in Article 308. This was approximately 12 months after ratification. Today, UNCLOS is a globally recognised legal provision that provides direction in all matters regarding the law of the sea. UNCLOS is what led to the development of SDG 14. Therefore, this paper uses SDG 14

as a frame of reference and as a primary source of Public International Law. UNCLOS has 320 articles and 9 annexures that governs a wide range of issues relating to the marine environment. These include marine economic activities, environmental control, ocean space, marine research, delimitation, disputes relating to Oceans, and technology transfer. In this context, this research aims to analyse the legal applicability of these regulations by an analysis of events in the Arabian Gulf.

1.2 Research Objectives and Questions

This research seeks to investigate the applicability of international law in the cases of marine pollution events in the Arabian Gulf. As discussed above, oil exploration and exploitation in the Arabian Gulf has led to an unprecedented level of environmental damage and degradation. Most of these cases of pollution can be linked to preventable human occurrences. History has also shown that simple enactment of local laws without enforcement does not result in meaningful reduction in oil pollution. It is therefore, imperative for states around the Gulf to apply international laws and conventions.

One of the primary objectives of this paper is to conduct a comparative analysis of marine pollution prevention efforts in the Arabian Gulf and the North Sea. It can be argued, the North Sea and the Arabian Gulf share unique sets of circumstances in terms of oil exploration and tanker activities. Although these regions face similar pollution challenges, there are vivid differences in the resolution and implementation of preventive policies (Le Blanc, Freire, & Vierros, 2017). As will be discussed in preceding chapters, there seems to be a higher level of cooperation between states in the North Sea in comparison to states in the Arabian Gulf.

To this end, this research will study conventions, agreements, and treaties from both regions and examine the level of cooperation towards the attainment of set objectives. The spirit behind the formation of the SDGs, especially SDG 14, calls for partnership and cooperation in the attainment of regional pollution prevention goals (Houghton, 2014). Moreover, extant research shows that cooperation is critical in the attainment

of regional maritime goals. Researchers like Al Fartoosi (2013) have pointed out the lack of cooperation

States cannot enact international law in isolation. With increasing oil exploration in the Arabian Gulf, there is need for a closer study of the legal regimes, especially from an international perspective, so that cases of oil pollution are effectively dealt with. The objective of this is study is therefore, to shed light on the applicability of these international laws. This study will clearly illustrate how major issues related to marine oil pollution and international law are interrelated. The thesis will also highlight the need for marine pollution to evolve with international law so that cases of pollution are promptly handled.

The following objectives were formulated to aid the current research:

- To conduct a fundamental analysis of the international legal protocols, agreements, and committees constituted to curb marine pollution.
- To analyse UNCLOS and SDG 14
- To investigate and explain the nature and sources and the consequences of marine pollution and oil spills in the Arabian Gulf.
- To examine the role of the GCC states in combating marine pollution.
- To analyse the legal view of oil exploration from the perspective of the United Nations
- To analyse different types of exploration such as offshore oil exploration and how United Nations has historically applied international laws to prevent cases of oil pollution

Moreover, this research will investigate the different ways that marine oil pollution occurs and the extent to which it affects other nations and marine wildlife. The objective of this will be to examine the potential of conflicts that may arise in case of extensive oil pollution in the Arabian Gulf. Notably, most of the countries in the Arabian Gulf are dependent on oil exploration it is therefore important to analyse how vital the

oil sector is important to the countries surrounding the Arabian Gulf. This paper seeks to delve into the issue of international boundaries and state sovereignty.

The research questions that will be formulated for this paper are based on the study of the SDG 14 and international legal instruments that exist to protect against marine oil pollution. The questions have also been formulated on the basis of how the legal obligations under this laws have been enforced.

To satisfy the aforementioned objectives, the study will answer the following research questions:

- What is the role of the GCC in preventing marine pollution in the Arabian Gulf?
- What is the success of international legal instruments in preventing oil pollution in the Arabian Gulf?
- Does the current formulation and structure of legal instruments, conventions, and treaties convince countries in the Arabian Gulf to comply with obligations of preventing oil pollution?
- Can SDG 14, as currently formulated, actualise the vision of a single legal instrument that prevents against marine pollution

1.3 Statement of Research ´Problem

Today, the Arabian Gulf ecosystem can be categorised as vulnerable and fragile. Unlike other water bodies, the Arabian Gulf sits in a shallow and semi-closed section of the sea that is surrounded by land. Although the Gulf has major rivers flowing in and out it, they are not sufficient to balance any adverse effects that can result from oil pollution (Kämpf & Sadrinasab, 2006). These rivers include river Euphrates and river Tigris which flow into the gulf and Dozdan and Jagin which flow out of the Arabian Gulf (Kämpf & Sadrinasab, 2006). These rivers join to form the Shatt-Al-Arab. Because of the circulation imbalance. Instead, any oil spill tends to concentrate which

worsens the effects of pollution. Despite oil pollution being a perennial problem affecting the Gulf States, there is no effective and coordinated regulation that guards against pollution. Because of its fragile nature and its rich oil deposits, the Arabian Gulf is exposed to high oil pollution risks than any other country in the world.

Oil pollution has resulted in adverse effects to the marine ecosystem and surrounding biological systems. On the other hand, oil is a very important natural resource to the world. Today, oil pollution regulation and compensation is one of the most analysed areas by legal scholars and academicians (Nathan, 2017). Internationally, the Civil Liability Convention (CLC) is the body tasked with regulations of issues surrounding compensation and liability regarding oil pollution (Nathan, 2017). However, experts have questioned whether the body protects against marine pollution, especially in high risk areas like the Arabian Gulf.

As will be addressed later in this paper, preventive measures are always better than reactive measures such as remediation and damage control. This is irrespective of the costs incurred. For example, the Gulf War clean-up since 1991 has incurred costs of more than $700 Million. Kuwait is still dealing with the effects of the oil spill up to today. Overall, it is today obvious that the oil pollution in the Arabian Gulf has transboundary effects. It therefore needs to be approached with an international dimension.

1.4 Proposed Research Methodology

This research takes a qualitative research approach. The qualitative analysis is used to gain an understanding of the motivation, reasons, and aftermath of the different legal principles and convention surrounding marine pollution and the Arabian Gulf. For the topic under study, there is a wide range of data sets that can be used. A case study approach is therefore used to perform the data analysis. Secondary sources are also used during the research. In particular, the study seeks to analyse and conduct an appraisal of different scholarly texts surrounding the topic of marine pollution in the Arabian Gulf. The literary documents include legal documents, agreements, treaties,

and research papers. Different writings proposing new solutions to the issues of a marine in the Arabian Gulf are also analysed. Moreover, the study will utilise a qualitative approach that comes with the following methodology objectives:

- Analyses the long-term effects of historical agreements.
- An investigation of regional and international efforts aimed at preventing marine pollution.

1.5 Research Scope and Limitations

A wide range of activities lead to oil pollution. Apart from destroying the natural ecosystem of a single country, oil pollution leads to an uncharacteristic harm to the global natural ecosystem (Spellman, 2017). Historically, marine pollution was referred to as marine damage. However, under the developed international law, marine pollution is referred to as international environmental damage (Nathan, 2017). Currently, the international provisions protecting against marine pollution is guided by four fundamental aspects;

- Human causation
- Relationship between environmental damage and the activity that caused it
- Threshold and severity of legal action
- Movement pollution from one international border to another

In particular, this research takes a look at various types of pollution that have resulted from oil exploration and transportation. This research will also discuss the purpose of environmental law and the legal basis which protects against oil pollution. This analysis will bring into focus the primary issues surrounding the oil pollution in the Arabian Gulf. Today, there is consensus among legal experts that the current regulations against pollution does protect against pollution in the Arabian Gulf (Al-Azab, 2005). This research attempts to find a common ground between oil pollution in the Arabian Gulf and the role of international law in prevention of pollution.

Notably, this research delves into different legal redress available in instances where oil pollution caused by one country threatens the biodiversity of another country. Most importantly, the purpose of International law is to provide reparation in cases where local laws are inadequate. Some of the provisions covered under the UN's SDGs are also stipulated by the ILC (International Law Commission). The ILC conducts extensive examination of the responsibility of states instances of international cases of pollution (Williams & De Mestral 1979). This means that international maritime issues are sometimes addressed by more than one convention or regulation.

1.6 Literature Review

A lot of scholarly attention has been focused on the issue of marine pollution in the Arabian Gulf and other areas like the North Sea. However, the issues of marine pollution have remained persistent throughout history. Most of the current research focuses on regional and international efforts targeted at preventing oil pollution. No current literature performs inter-region comparison of marine pollution prevention efforts. Throughout history, notable international attempts have been made to tackle the issue of marine pollution. These included, the 1954 OILPOL and the MARPOL of 1973 (Carpenter, 2011). There have also been international discussions at the UN level aimed at addressing marine pollution. Such discussions attracted much attention that the UN officially embedded them in Section 12 of the UNCLOS (Alturki, 2015). In the context of the Arabian Gulf, the UN has arguably been somehow successful in defining the liabilities of coastal states in preventing marine pollution. The Arabian Gulf is an area of distinct characteristics whose geographical location increase its risks of marine pollution.

Cooperation is a critical element in the attainment of any regional and international objectives (Alturki, 2015). The importance of cooperation is also outlined in SDG 17 as a means of implementation of the SDGs (Houghton, 2014). As will be discussed below, it can be argued that lack of cooperation is the reason the Arabian Gulf lags behind the North Sea in matters associated with marine pollution. Researchers like Al-

Azab (2005) and Nathan (2017) have highlighted lack of cooperation as an impediment to pollution prevention.

1.6.1 Addressing the Research Gap

The motivation behind this research is the current scholarly gap in the study of the role of international law in safeguarding against marine pollution, especially in the context of the Arabian Gulf. This research will analyse this gap through a comparative analysis. Despite the similarity between the Arabian Gulf and North Sea, there are currently no studies that conducts a comparative analysis. This research is also motivated by the need to ascertain the current state of affairs of the Arabian Gulf pollution and the applicability of international law. There have been a lot of cases involving marine pollution and it's sometimes very complex for the nations around the Gulf to apply international law, especially in determining legal liability and compensation. Oil pollution keeps on occurring in the Arabian Gulf causing serious environmental damage. There is a need for clarity in regards to the applicable international law in cases of oil spillage.

Despite the considerable effort that has been channelled towards the implementation of UNCLOS and SDG 14, oceans are still significantly affected by marine pollution. Some evidence suggests that UNCLOS implementation is affected by the lack of cooperation and coordination among member states. This research aims to analyse these challenges in the context of the Arabian Gulf. Extant literature in the study of marine pollution in the Arabian Gulf mainly focuses on the causative factors (Vaughan, Al-Mansoori, & Burt, 2018). Only a few papers discuss the current state of play relevant to preventive measures taken to tackle the problem (El-Habr & Hutchinson, 2008; Freije, 2014; Prasad & Anuprakash, 2016).

There are also a limited number of studies that have conducted a systematic exercise for oceans – SDG 14 (Le Blanc, Freire, & Vierros, 2017). This dissertation fills this gap and provides a comprehensive overview of marine pollution in the Arabian Gulf with the aim to reach SDG 14. The relevance of this research also comes from the global importance of the Arabian Gulf. Given the significant international dependence

on oil from the Gulf States, there is no doubt that the region faces unavoidable environmental catastrophe. Although the area suffers from different types of pollution such as wastewater discharge, oil spills represent the principal challenge (Issa & Vempatti, 2018).

In addition, this research studies existing relationships between countries in the Arabian Gulf and their use of international laws against marine pollution. The study of existing relationships is important because it gives an overview of a state's perception of the marine ecosystem in the Arabian Gulf.

2 Chapter 2: International Efforts to Curb Marine Oil Pollution

2.1 Marine Oil Pollution and the International response

As defined in the previous chapters, marine pollution refers to any introduction of harmful substances into the marine environment (Cormack, 1999). There are many types of pollution; air, water, land, and thermal (Cormack, 1999). This paper analyses pollution that is as a result of activities at sea. In this context, pollution can be categorised as point pollution or non-point solution. Point pollution is pollution that originates from an identifiable source such as a direct discharge of waste water or industrial waste into Oceans. On the other hand, non-point pollution are those that emanate from ill-defined sources.

Marine oil pollution occurs from either inland mining or deep sea mining. Inland mining pollution occurs when the discharge of mineral deposits such as copper and oil wash up onto the Ocean (Cormack, 1999). This kind of pollution is detected when pollutants affect the development of marine organisms such as coral reefs. In deep sea mining, minerals are extracted from the deep floor of Oceans. This kind of mining involves drilling and removal of mineral extraction from the sea bed. The processes used in deep mining mineral extraction are usually known to cause turbulences that may interfere with the sea floor and may destroy the habitat of marine wildlife.

2.1.1 Marine Pollution from Oil Ships

Oil spills from tankers are by far the biggest source of marine oil pollution. In many instances, oil tankers are known to illegally discharge wastes into Oceans. Oil discharged from tankers can spread into wide territories and cause damage to the natural habitat of species such as coral reefs and algae (Cormack, 1999). Oil spills are also known to facilitate the spread of diseases and may even introduce toxic materials that can alter the genetic makeup of plants and animals. In most cases, oil spills may jeopardize the ability of marine animals in obtaining food. Moreover, the toxic polycyclic

aromatic hydrocarbons (PAHs) that is a component of crude oil is sometimes difficult to clean up. Effects of PAHs may last for years (Terhune, 2011).

2.1.2 Statistics on the number of Oil Spills

According to the International Tanker Owners Pollution Federation Limited (ITOPF), oil spills are categorised in terms of size (ITOPF, 2002). Oil spills can be; less than 7 tonnes, between 7 and 7,000 tonnes, and above 700 tonnes. The actual amount of oil spill is usually recorded during categorization. Large oil spills tend to occur as a result of major events such as collisions, intentional bombings, fires and explosions, and structural damages. The table below gives a historical account of all the major oil spills that occurred after the 1967 Torrey Canyon disaster. Notably, 95% of the largest oil spills occurred in the 1970s, 1980s, and 1990s. This shows that the incidence of marine oil pollution has observed a downtrend. Moreover, evidence shows that a number of the oil spills recorded in the table had a insignificant effect on the marine environment.

Table 1 Major oil spills since 1977

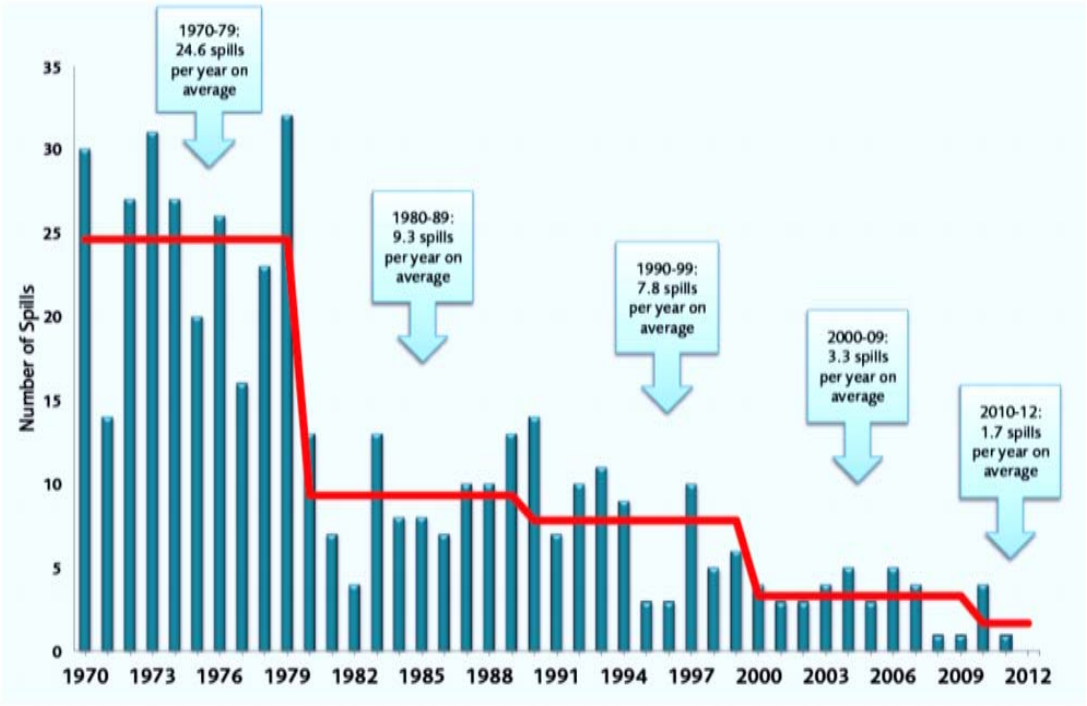
Position	Ship name	Year	Location	Spill size (tonnes)
1	Atlantic Empress	1979	Off Tobago, West Indies	287,000
2	Abt Summer	1991	700 nautical miles off Angola	260,000
3	Castillo de Bellver	1983	Off Saldanha Bay, South Africa	252,000
4	Amoco Cadiz	1978	Off Brittany, France	223,000
5	Haven	1991	Genoa, Italy	144,000
6	Odyssey	1988	700 nautical miles off Nova Scotia, Canada	132,000
7	Torrey Canyon	1967	Scilly Isles, UK	119,000
8	Sea Star	1972	Gulf of Oman	115,000
9	Irenes Serenade	1980	Navarino Bay, Greece	100,000
10	Urquiola	1976	La Coruna, Spain	100,000
11	Hawaiian Patriot	1977	300 nautical miles off Honolulu	95,000
12	Independenta	1979	Bosphorus, Turkey	95,000
13	Jakob Maersk	1975	Oporto, Portugal Oporto, Portugal	88,000
14	Braer	1993	Shetland Islands, UK	85,000
15	Khark 5	1989	120 nautical miles off Atlantic coast of Morocco	80,000
16	Aegean Sea	1992	La Coruna, Spain	74,000
17	Sea Empress	1996	Milford Haven, UK	72,000
18	Nova	1985	Off Kharg Island, Gulf of Iran	70,000
19	Katina P	1992	Off Maputo, Mozambique	66,700
20	Prestige	2002	Off Galicia, Spain	63,000

Source: (ITOPF Handbook)

From the table, it can be seen that incidents concerning large oil spills, above 700 tonnes have decreased. For instance, between the years 200 and 2009 the average number of oil spills was just 3, 12.5% of the number of spills witnessed in 1970s (ITOPF, 2002). The table also shows that 55% of oil spills occurred in the 1970s while only 7% occurred in the 2000s. Notably, there has been a reduction in the occurrence of medium sized oil spills. The table shows only 15 medium size oil spills in the 2000s. In the 1990s the number of medium sized oil spills was almost double.

Data from ITOPF shows a substantial reduction in the total volume of oil spills between the year 1970 and 2012 (ITOPF, 2002). In particular, the number of oil spills recorded in the year 2000 is the lowest ever recorded. This is shown in the table below:

Figure 2. Trends in Oil Spills>700 tonnes



Source: (ITOPF, 2002)

Table 2. Quantity of Oil Spills from 1970s to 2000s

Year	Quantity (Tonnes)		Year	Quantity (Tonnes)		Year	Quantity (Tonnes)		Year	Quantity (Tonnes)
1970	409000		1980	206000		1990	61000		2000	14000
1971	143000		1981	48000		1991	431000		2001	8000
1972	313000		1082	12000		1992	167000		2002	67000
1973	159000		1983	382000		1993	140000		2003	43000
1974	173000		1984	29000		1994	130000		2004	16000
1975	351000		1985	85000		1995	12000		2005	18000
1976	364000		1986	19000		1996	80000		2006	23000
1977	275000		1987	30000		1997	72000		2007	19000
1978	393000		1988	190000		1998	13000		2008	3000
1979	636000		1989	174000		1999	29000		2009	2000
Total	3218000		**Total**	1176000		**Total**	1135000		**Total**	212000

Source: (ITOPF, 2002)

2.1.3 Effect of Spilled Oil on the Marine Environment

There are different types of oils, which can have detrimental effects to the marine environment. These include crude oil, petroleum, petroleum by products, and persistent oils (ITOPF, 2002). Depending on the type of oil spilled, different processes follow after an oil spill. These processes may cause the disappearance of oil from the seas surface. However, other types of oil may remain deposited in the Ocean water for a long time. Overall, the long-term and short-term effect of oil depends on several characteristics. These include; the density, boiling point, viscosity, flash point, solubility, asphaltenes content, and pour point.

The density of water determines its buoyancy, which in turn determines the extent that a specific type of oil spreads. In general, oil is usually considered less dense compared to water. The boiling point also determines the total amount of oil that remains in water. Oil with a lower boiling point evaporates quickly compared to oil with a higher boiling point. A negative correlation exists between the viscosity of oil and the speed at which oil spreads in water. Highly viscous oil moves slowly compared to lowly oil.

After oil is spilled in the Ocean, it undergoes a natural weathering process. Four key factors determine the weathering process. These are;

- Chemical composition of the oil spilled
- Physical characteristics of the oil. These include viscosity, boiling point, gravity, and density
- The meteorological condition of the area of the oil spill
- The characteristic of the Ocean water. These include aspects such as temperature, bacteria composition, and presence of dissolved oxygen and sediments.

Because density of oil is higher than that of Ocean water, oil spreads very fast in water. In general, the knowledge of these factors is very crucial when responding to an oil spill crisis. The effect oil has on marine wildlife is also heavily dependent on these characteristics (ITOPF, 2002). Physical features of the affected region also play a huge part in determining the general effect of an oil spill incidence. Depending on the biodiversity of an area, an oil spill causes damages such as oil coated coastlines, moribund wildlife, and sea birds covered with oil.

Oil pollution has also been linked to long-term population and climatic effects (ITOPF, 2002). Even in small amounts, oil spills consistently released to the environment results into long-term effects. Changes in the marine environment that are as a result of oil pollution can be detected using two distinct methodologies; through the collection and analysis of observable data and through measurement of the impact of oil by examining the effect of oil on Ocean species that directly interact with oil.

Assessing the impact of Oil by studying affected organisms is one of the most effective ways of measuring the environmental impact of oil pollution. This is because observational measurements may be subject to bias or assumptions. For example, scientists assess pollution impact by measuring environmental interference in the habitat of sea line animals such as fulmars, razorbills, and guillemots (National Academy of Science, 2003). These birds are usually affected by oil spills because they sometimes dive in water to get food. Moreover, when the birds get coated in oil they are likely to die

because of excess heat. Some birds also lose the ability to fly after contact with oil (ITOPF, 2002). Birds that live in the shorelines may starve to death because their source of food is covered with oil.

Fish and shellfish are also directly affected by oil (ITOPF, 2002). Habitats of shellfish are directly affected by oil spills. Sea mammals like whales and Dolphins are not directly affected by oil spills unless they come to the shore, usually to breed. Mammals that suffer the most from oils spills are those that have fur (National Academy of Science, 2003). When animals with fur come in contact with spilled oil, they may die as a result of overheating or hypothermia. Extant research also shows that oil spills are toxic to planktons and other water column organisms. Animals and plants in shorelines can be physically coated with spilled oil. Such plants and animals may suffer from long term effects of oil.

2.2 International Oil Regimes Established to Prevent Oil pollution

2.2.1 Regimes that Prevent Oil Pollution from Ships

The 20th century has witnessed a significant growth and expansion of the maritime transport industry. This improvement has in turn created one of the biggest sources of maritime pollution. In the early days of marine oil transportation, many countries developed treaties and conventions to safeguard against marine pollution (IMO, 1991). In 1954, OILPOL was created. OILPOL was a product of the first conference about marine oil pollution organised by the United Kingdom. OILPOL came into force in 1958. Subsequently, the secretariat function of OILPOL was transferred to the IMO in the same year.

2.2.2 International Convention for Prevention of Oil Pollution of the Sea by Oil (OILPOL)

OILPOL was established in 1954 but was amended in the years 1962, 1969, and 1971. Amendment of OILPOL came with the addition and deletion of important issues that addresses several aspects of pollution resulting from Ocean machinery such as ships. The main objective of the convention was to address crude oil pollution in the following ways;

- Establishment of prohibited zones covering at least 50 miles from land.
- Promote the establishment of facilities to promote the reuse and reception of oily waters.

Subsequent amendment of OILPOL by IMO extended the prohibition zones and set minimum tonnage levels. After the Torrey Canyon incident, the IMO established another conference which aimed to restraint pollution in both the air and the sea (IMO, 1991). The convention was called MARPOL.

2.2.3 MARPOL 73/78 (International Convention for the Prevention of Pollution from Ships)

The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) Convention came into force in 1978. The pollution addressed all forms of pollution that posed a risk to the Ocean. These included sewage, chemicals, garbage, and oil. The main objective of the convention was to prevent marine pollution from ships.

2.2.4 Civil Liability for Oil Pollution Convention (CL Convention)

The Convention on Civil liability for Oil Pollution was established in 1965. The convention came into force in 1975 (IMO, 1991). The main objective of the CL convention was to create a mechanism that could facilitate the process of liability compensation in the event of marine oil pollution. In particular, CL deals with damage compensation of marine pollution that is caused by maritime accidents.

2.2.5 International Convention on Civil liability for Bunker Oil Pollution (the Bunker Convention)

The International Convention on Civil liability for Bunker Oil Pollution (the Bunker Convention), also called the Bunker Oil convention, this protocol provides a framework for the determination of liability that occurs as a result of bunkering operations. The convention is used to guarantee swift and straightforward compensation processes in case of pollution as a result of bunkering (IMO, 1991). The convention was established in 2001 but came into force in 2008.

2.2.6 International Convention regarding Intervention in Cases of High Sea Pollution (the Intervention Convention)

The International Convention regarding Intervention in Cases of High Sea Pollution was enacted in 1969. The convention regulates if and what measures coastal States can take on the high seas to be able to prevent, mitigate or eliminate any danger from oil pollution to the coastline or other interests after a maritime accident. It was adopted on the 29th of November 1969 and entered into force on the 6th of May 1975. The Convention applies to all seagoing vessels, except warships or non-commercial State-owned vessels. However, the State is only allowed to take necessary actions and must consult with the Flag State or States of the ships involved, the owners of ship and cargo and possibly independent experts. If States take further actions, they are liable to pay compensation for any damage caused by their actions (UN, 1969). The original Intervention Convention only applied to oil spills, but recognizing the importance of other substances, this was expanded at the 1973 London Conference to include the substances listed in the Annex (REF). The 1973 Protocol entered into force in 1983 and the list of substances amended in 1996 and 2002. However, this Convention does not specify which measures that could be used during an intervention.

2.2.7 International Convention on Oil Pollution Preparedness, Response and Co-operation

The International Convention on Oil Pollution Preparedness, Response and Co-operation, known as the OPRC Convention (IMO, 1990), is the largest international agreement on oil spill response cooperation. It was adopted on the 30th of November in 1990 and entered into force on the 13th of May 1995. As of November 2018, it has 112 signatory states (IMO, 2014). A Protocol was added to the OPRC in 2000, called the OPRC-HNS that address spills of Hazardous and Noxious Substances (HNS) (IMO, 2000). Parties to the OPRC are required to have measures in place for dealing with pollution incidents, both nationally and in cooperation with other countries. It requires the Parties to have stockpiles of oil spill combating equipment, conduct oil spill exercises and have detailed plans for pollution incidents. The Parties are also required to provide assistance to others in the event of a pollution emergency (IMO, 1990). The OPRC requires ships to have an on board oil spill plan or HNS pollution plan, as appropriate. The same is required by offshore installations under the jurisdiction of any of the Parties. The plans must be coordinated with national plans to be able to have an effective oil pollution response in case of an incident. Ships are also required to report pollution incidents to coastal authorities (IMO, 1990). However, while a very important convention when it comes to oil spill response and cooperation, the OPRC does not make any reference to oil spill interventions.

2.3 State Responsibility in Marine Pollution

State responsibility on matters regarding marine pollution has undergone significant developments in the last few decades. Over the years, there has been developments of critical principles that today determine the principles of marine environment law. These principles today determine the responsibility as well as the liability of coastal states on key issues regarding environmental protection and the rights of coastal states.

2.3.1 UNCLOS in Marine Pollution

State responsibility on matters regarding marine pollution has undergone significant developments in the last few decades. Over the years, there has been developments of critical principles that today determine the principles of marine environment law (Johansson & Donner, 2015). These principles today determine the responsibility as well as the liability of coastal states on key issues regarding environmental protection and the rights of coastal states (Johansson & Donner, 2015).

The general obligation of states on matters pertaining to marine pollution is contained in Article 192 and 194. In particular, part XII of UNCLOS contains provisions that direct states to preserve and protect the marine environment (Johansson & Donner, 2015). The section outlines the responsibility of states in instances of vessel pollution and the right of state's to exploit natural resources within their boundaries. Article 194 is the central provision that outlines the responsibility of states in the protection of biodiversity and the fragile marine ecosystem (Johansson & Donner, 2015). Most experts regard UNCLOS as a holistic provision that can be used to address the complex range of issues that may emanate from the use of marine resources.

The two key jurisdictions in matters pertaining state responsibilities include the flag state jurisdiction and the coastal state jurisdiction. Relevant to this research, these jurisdictions provide frameworks that are used in the determination of the extent of regional conventions and in the determination of the territorial sovereignty of states. In Article 211 (2), there are provisions that bind all flag states to constitute laws that are in alignment with the core conventions of UNCLOS (Johansson & Donner, 2015). In particular, states are obligated to formulate laws that parallel those contained in international conventions. Under Article 2 (1) and 211 (3), coastal states reserve the right to create regulations regarding matters relating to marine pollution (Johansson & Donner, 2015). These states can also create legislations that limit the freedom of flag states.

As discussed above, all states are obligated to ensure the safety of its citizen and the environment in all economic activities including the transportation and extraction of oil. According to SDG 14, UNCLOS, and the numerous international conventions

against marine pollution, states are obligated not to cause pollution in the seas as affected states may seek legal redress under international law (IMO, 1991). In particular, state responsibility stipulates that any breach of any form of environmental state responsibility may lead to legal action such as compensation.

In marine pollution, state responsibility also determines the level of breach and the consequences of a particular breach. According to stipulations set by the International Law Commission (ILC), a state may also be responsible for certain acts of pollution if it fails to control the entities that cause pollution (Johansson & Donner, 2015).

2.3.2 The Convention on Biological Diversity

Also called the Biodiversity Treaty, the convention on biological diversity was created to boost conservation activities and to ensure biodiversity. In particular, the principles of the convention promote equitable sharing and use of marine resources. The convention was finalised in Nairobi, Kenya in May1992 and was open to signatures the same year in June in the United Nations Conference on Environment and Development summit (IMO, 1991).

The convention came into force in December 1992 and includes over 190 countries including countries in the European Union. Among other issues, the convention calls for immediate protection of sensitive ecosystems and the enactment of regional legislation that protects against endangered plant and animals.

2.3.3 The Convention on Migratory Species

This convention is commonly referred to as CMS (Convention on Migratory Species). The objective of the convention is the protection of the habitats of avian and marine migratory species. The convention entered into force 35 years ago on 1st November 1983 and today boasts a signatory of 120 countries (IMO, 2001). The three fundamental principles of the conventions state that;

a) States should aid and cooperate with other states to conduct research on matters concerning migratory species

b) States should strive to offer protection to all kinds of migratory species
c) States should strive to conclude all started agreements concerning the conservation of migratory species

2.3.4 CLC and FUND

The CLC refers to the Civil Liability for Oil Pollution Damage Convention of 1969. The convention entered into force in 1975. The main objective of the convention was to ensure adequate compensation for victims of intentional and non-intentional oil pollution. According to the convention, the liability of damage of pollution lies on the owner of the ship (IMO, 2001). On the other hand, FUND refers to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage of 1971. The FUND convention was created to address the shortfalls of the CLC. FUND address the technical aspect required in the process of compensation in instances of oil pollution. These include the legal and financial measures applied.

2.4 Chapter Summary and Critical Analysis

This chapter has identified key international conventions that are relevant to the issue of marine pollution and environmental law in general. Notably, the discussion has established that international law provides the basis for the development of regional regimes and conventions. Moreover, the chapter has identified that Flag States and Coastal States are protected by regulations that determine territorial integrity and sovereignty. Moreover, the idea of accountability and liability, which is incorporated in different treaties, stipulate consequences for marine pollution actions.

However, there are still questions surrounding the effectiveness of these conventions. Although most Gulf States are signatory to most conventions, there is lacklustre evidence that shows the effectiveness of the agreements in preventing big time marine

pollution from oil activities. For instance, pollution of the magnitude witnessed in the Gulf War, should have been preventable if Gulf States acted in the interest of the environment. In some instances, it seems that states are sometimes ready to sacrifice the environment for strategic and economic interests.

Subsequently, the next chapter analyses the role of various international treaties in the Arabian Gulf. The chapter also studies the development of regional treaties that incorporate the historical uniqueness of the Arabian Gulf.

3 Chapter 3: Regional Efforts to Curb Marine Oil Pollution

3.1 The Arabian Gulf Historical Perspective

Since historical times, and before the discovery of oil, the Arabian Gulf has been a strategic area for international trade (Al-Azab, 2005). For instance, the Arabian Gulf offers the easiest route between European countries and India (Shraim et al., 2017). The biggest international interest of the Arabian Gulf came from Britain in the 19th and 20th century (Al-Azab, 2005). During this time, the British government played a critical role in the politics of the area.

Because of high tensions created by groups like Al-Qawasim, British authorities established maritime truces that outlawed military attacks in the sea (Le Quesne et al., 2018). The sea passage was very important to Britain as it was an easier way to reach India. The British played a key role in ensuring that smaller states were protected from more powerful states. Because of the presence of the British in the area, the countries around the Arabian Gulf flourished economically (Alturki, 2015). The region provided a reliable maritime route used by merchants from all over the world. The main trade in the Arabian Gulf was the trade of pearl and the slave trade.

In the 1930s, slave trade was abandoned because of pressure from the British (Alturki, 2015). Pearl trade had also declined because of influence from Japan. The discovery of oil changed the fortunes for the Gulf States. However, it was later in the 1950s that Gulf States started receiving considerable revenues from the oil trade (Freije, 2014). Foreign companies mostly managed the extraction and exportation of oil in the Gulf until the 1970s.

3.1.1 Environmental Features of the Arabian Gulf

The Arabian Gulf is endowed by a wide range of environmental features. The Arabian Gulf is located in the Middle East between latitude 24 and 30 degrees North (Al Fartoosi, 2013). The Arabian Gulf is the larger part of the Arabian Sea Ecoregion. The region is a segment of the tropical Indo-Pacific Ocean. The region is considerably shallow with an average depth of 34 m and an area that is approximately 240,000 km square.

The Arabian Gulf experiences high variations in extreme weather conditions. This is mainly because of the high latitude geographical position of the Gulf (Al Fartoosi, 2013). Temperatures in the Sea vary between 15-36 degrees. Salinity in the sea is reported to vary between 43 and 80 psu (Al Fartoosi, 2013). Organisms in the Arabian Gulf therefore live in very strict conditions.

Despite the harsh conditions present in the area, the Arabian Gulf supports a wide range of organisms. These include seagrass, mangrove swamps, sand flats, and coral reefs (Freije, 2014). These ecosystems play an integral role in the Arabian Gulf ecosystems by providing nursery and feeding grounds to the plants and animals in the ecosystem.

People of the Arabian Gulf relate to the marine ecosystem both culturally and economically. Features such as sea grass, mangroves, and coral reefs have a significant influence on the marine resources in the Arabian Gulf (Shraim et al., 2017). Ecological experts consider the ecosystem as Valued Ecosystem Components (VECs). This is because the region provides important ecological goods. The Arabian Gulf ecosystem is also rich in fish which provide a source of food to people around the Arabian Gulf.

3.1.2 Sources of pollution in the Arabian Gulf

As discussed, pollution in the Arabian Gulf occurs as a result of a wide range of causes. These may include oil industry leaks, desalination plants, and oil spills as a result of wars (Williams & De Mestral 1979). For example, the Gulf War resulted in one of the highest ever recorded rates of contamination and sea sulphate contamination deposits.

Research shows that the contamination was highly concentrated in areas where vessels had sunk.

3.2 Marine Pollution in the Arabian Gulf

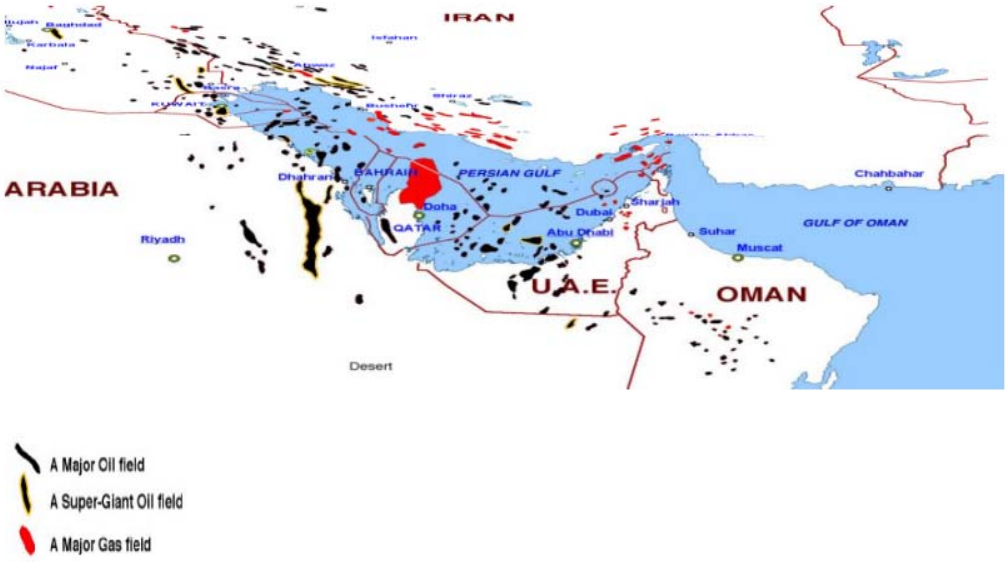
The Arabian Gulf sits in a strategic location given the proximity to international networks. The Gulf is part of the larger Arabian Sea and borders 8 countries; Kuwait, Iraq, Qatar, Bahrain, United Arab Emirates, Saudi Arabia, and Oman. Moreover, the Gulf covers a surface of approximately 239,000 km^2 and has a water volume of about 8,630 km^3 (Le Quesne et al., 2018). Below is an image showing the Arabian Gulf countries.

Figure 3. Arabian Gulf Countries

Source: (Khan, et al., 2002)

Since the discovery of oil and gas, the Arabian Gulf region has witnessed significant economic and industrial development. Today, the region plays a dominant role in the international oil sector. The Gulf is home to a large number of oil installation and has one of the highest traffic of oil tankers (British Petroleum BP, 2013).

Figure 4. The Number of Oil Installations in the Arabian Gulf



Source: (ROPME, 2013)

3.2.1 Oil Spillage Incidents in the Arabian Gulf

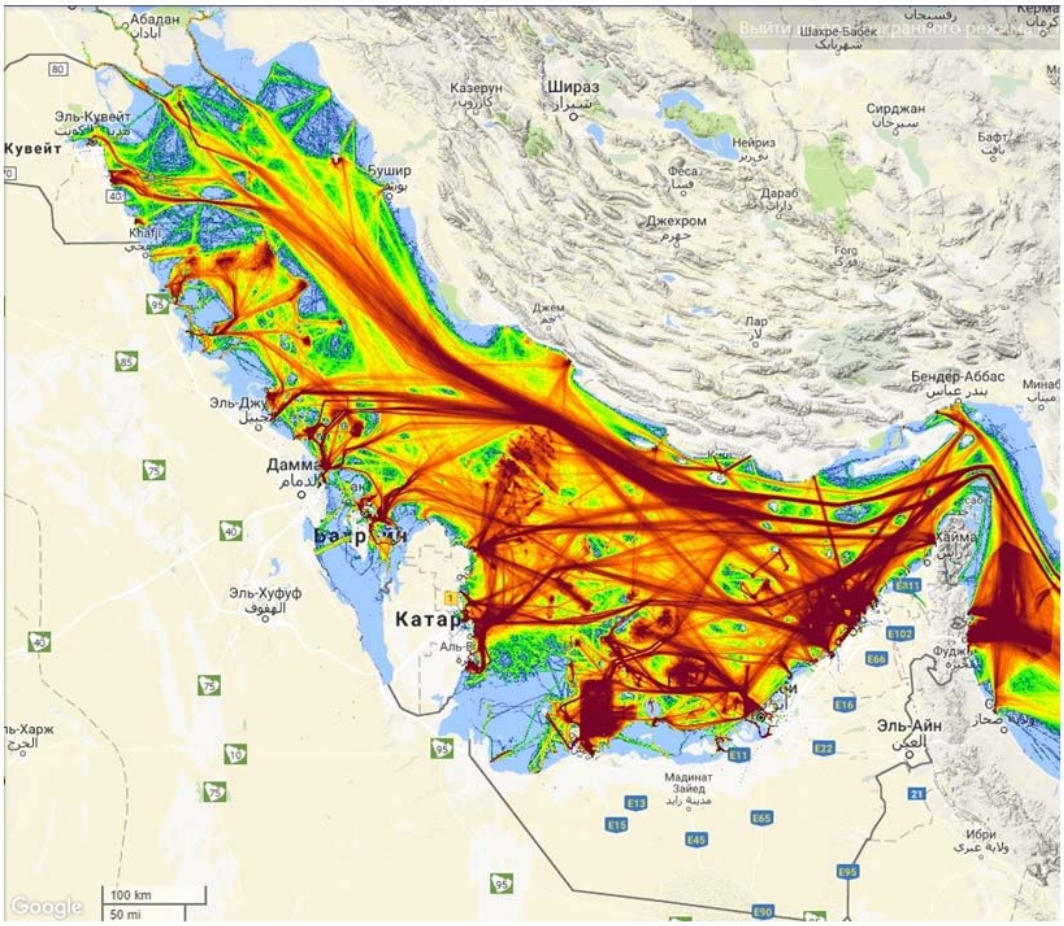
Although there are many sources of pollution in the Arabian Gulf, oil spills and leakages are the primary sources of marine pollution. The Arabian Gulf is home to the largest oil spill in the world. Extant research shows that approximately 10 million barrels of oil were spilled into the Arabian Gulf in 1991 during the Gulf War. The spill occurred when dessert oil wells were set on fire by Iraqi troops as they were retreating from Kuwait (Sadiq & McCain, 1993).

Because of dictatorship regimes like the Saddam Regime, the Gulf area has endured a lot of oil spill incidents in the first and the second Gulf Wars. In the second Gulf war, records show that approximately 9 million barrels of oil was spilled in 22 different oil

spill incidents (Sadiq & McCain, 1993). Moreover, researchers like Lavieren, et al. (2010) report that over 70 ships were sunk during the war. These vessels still lie on the seabed of the Arabian Gulf and continue to have negative environmental effects.

There have also been a wide range of pollution related incidents associated with industrial activities around Arabian Gulf. According to Lavieren and David (2010), over 800 gas and oil platforms and 25 large oil terminals are located in the Arabian Gulf. It is also estimated that 25,000 oil tankers pass through the Strait of Hormuz annually.

Figure 5. Current Oil Pollution in the Arabian Gulf along ship traffic routes.



Source: (Lavieren and David, 2010)

In figure 5 above, the red line represents the traffic of ships passing through the Arabian Gulf. The yellow area represents potential discharges along the routes such as oil spills, ship washings, and ballast discharges.

3.2.2 Hydrocarbon Concentrations in the Arabian Gulf

The oil spills witnessed during the Gulf War had devastating effects on the waters of the Arabian Gulf. For example, published reports show high deposits of oil and hydrocarbon materials in the Saudi coastline and in the waters of Kuwait (Sadiq & McCain, 1993). Sediments collected in these areas showed hydrocarbon concentrations of between 2.8 and 248 microgram/gram (Sadiq & McCain, 1993). In Bahrain, extreme levels of hydrocarbon deposits were estimated to a level of (1600 µg/g) (Elshorbaghy, 2005).

In a different study conducted by Literathy & Zarba, (1985), it was estimated that the hydrocarbon concentration stood at 5.8 µg/g for collected seabed sediments. Moreover, a study conducted by DouAbul (1984) found hydrocarbon concentration of approximately 13 µg/g in the North of the Arabian Gulf, the area around Shatt Al-Arab.

The high concentrations of Total Petroleum Hydrocarbons (TPH) have had an enormous negative effect on different species living in the Arabian Gulf. High TPH concentrations are known to interfere with the food chain and to affect the breeding of species. These effects have been proven by a wide range of studies conducted on the different species in the Arabian Gulf. For instance, a report by Sadiq and McCain (1993) found that some fish species in areas highly impacted by oil spills cannot survive high temperature areas.

Most fish species in the Arabian Gulf commences its breeding time during spring when the water temperatures are significantly higher than normal. Any changes in temperature that may be brought about by the presence of dark plume from oil spills could lead to disastrous environmental effects (Poonian, 2003). Research has also shown significant damage on the Sea Turtle species in the Arabian Gulf (Poonian, 2003).

3.3 Regional Efforts towards Environmental Protection

There are a wide range of regional efforts that are specifically concerned with the protection of the Arabian Gulf. These include ROPME, the Gulf Secretariat, RESCO, CAMRE, and ROWA.

3.3.1 Regional Organization for the Protection of the Marine Environment (ROPME)

The Regional Organization for the Protection of the Marine Environment (ROPME) is situated in the capital of Kuwait. The main function of ROPME is to oversee and implement monitoring activities in the coastal marine environment of the Arabian Gulf (Cormack, 1999). Among other responsibilities, ROPME assembles and deploys resources that aid the protection and development of coastal states such as Iran, Kuwait, Iraq, Saudi Arabia, United Arab Emirates, and Qatar (Cormack, 1999). The first regional conference sponsored by ROPME was called the Conference of Plenipotentiaries. The conference was held in April 1978 and includes an action plan that charts a way forward for the protection and development of marine resources in coastal states (Cormack, 1999). The plan protects against pollution by oil and other affluent substances.

Since its adoption in 1978, ROPME has become the primary legal instrument for the Gulf States on all matters pertaining to protection of the marine environment. The convention embodies the commitment of the countries in preventing development activities from jeopardizing the marine environment. ROPME was created out of the recognition of the potential effect of pollution on the surrounding marine environment of the countries. As a regional convention, this study tries to probe the successes and failures of ROPME. In combating marine pollution.

The protocol that ROPME member states agreed signed on April 1978, has several obligations. For instance, the protocol requires every state to avail masters of ships and to report any marine emergency to the appropriate national authority (Nathan, 2017).

These states are also required to report the allocation and distribution of material and equipment that may cause pollution.

As previously discussed, the ROPME area is considered as the region with the highest pollution risk in the world. This is primarily due to the high level of oil related activities in the area. These activities necessitated the formation of protocols such as the Kuwait Action Plan (Nathan, 2017). The Kuwait Action Plan, referred to as KAP, created a framework that could be used for an environmentally conscious development of the region. During the initial development of KAP, its core objective was to assess the magnitude of oil pollution in the region. Other objectives of KAP were to conduct baseline studies on the oil activities in the region, conducting oceanography on the regions involved in the transport and distribution of oil, and conducting investigations on the effects of oil as a pollutant. Moreover, KAP supports a wide range of cooperative programs. These include contingency plans for accidents and maintenance of records on incidents relating to oil activities (Nathan, 2017).

The plan adopted by the regional states mostly controls activities associated with oil pollution, sewage, and industrial waste. The projects and programmes run by ROPME mainly cover similar areas. These projects range from public health awareness programs, coastal area management, GIS and remote sensing, and oceanography (Issa & Vempatti, 2018). One of the biggest achievement of ROPME was the establishment of the Marine Emergency Mutual Aid Centre (MEMAC). ROPME is also credited for the adoption of protocols protecting marine states from environmental hazards and land based activities that cause pollution.

MEMAC was established in Bahrain in the year 1983. The primary role of MEMAC was to facilitate the cooperation among states in efforts geared towards combating oil pollution (Issa & Vempatti, 2018). MEMAC also coordinates training, technological cooperation, and information exchange. MEMAC also gives member countries the platform to develop and agree on regional treaties for transboundary movements. MEMAC is also obligated to coordinate local pollution that affect multiple countries.

The ROPME area contains a wide range of biodiversity and valuable natural resources (ITOPF, 2002). These include wetlands, waterfowl, mangroves, turtles, corals, and many other animal species. Researchers estimate that the area contains twenty species of dolphins and more than a thousand fish species. The fish and whale species are known to have a large commercial value.

ROPME also has initiatives that support information sharing and capacity building. The launch of ROPME ushered in a period of information sharing among coastal states (Fowler, 1993). Today, information about oil and shipping activities is shared among member states. There are also plans by ROPME to create a regional database for sharing of information relating to the use of marine resources.

In addition to the aforementioned, ROPME also recognizes the importance of education and capacity building among member states. Education and training offered by ROPME primarily focuses on sustainable management and development of marine ecosystems. Sustainable development and education of member states is achieved with participation of governments, environmental institutions, and support groups. Because of its wide reach, it is critical for ROPME to coordinate efforts associated with awareness and training.

ROPME also plays a huge role in the protection of marine resources from pollution caused by micro plastics. To solve the issues associated with micro plastics, ROPME provides a platform that member states can use to settle disputes and work together towards combating the problem created by the use of micro plastics (Fowler, 1993). For instance, ROPME hosts regional workshops that discuss the effects of marine litter and micro plastics.

ROPME has also led the development of the following protocols.

- In 1989, Protocol concerning Marine Pollution resulting from Exploration and Exploitation of the Continental Shelf.
- In 1990, Protocol for the Protection of the Marine Environment against Pollution from Land-Based Sources.

- In 1998, Protocol on the Control of Marine Trans-boundary Movements and Disposal of Hazardous Wastes and Other Wastes.

ROPME also participates and sponsors initiatives aimed at creating public awareness about the dangers of marine debris and studies aimed at showing the effects of marine pollution.

As discussed above, ROPME also played a key role in the formation of MEMAC

3.3.2 The Gulf Cooperation Council Secretariat

The Gulf Cooperation Council Secretariat (GCC) is a secretariat office based in Riyadh. The primary role of the secretariat is to oversee information exchange, assessment, training, and to facilitate regional coordination of efforts geared towards the protection of the environment (Alturki, 2015). The Gulf Cooperation Council Secretariat (GCC) consist of the executive secretary who is appointed by the members of the council. The secretariat office works as a centre of coordination and also a source of information. Other functions of the secretariat are the preparation of invitations and relaying of critical information. The secretariat also oversees the distribution of member's laws regarding transboundary movements.

The GCC also enters into agreements and treaties that bind member states. For instance, in 2017, the GCC entered into an agreement with the UN to address pressing environmental issues faced by the GCC countries. The agreement proposed a new way of dealing with chemical wastes (Alturki, 2015). The agreement also contains guidelines for the management of dredging activities. The agreement reinforces the resolve of the GCC in promoting growth and enabling sustainable development.

3.3.3 The Regional Clean Sea Organization (RECSO)

The Regional Clean Sea Organization (RECSO) is a cooperative organization for countries in the oil industry. The Regional Clean Sea Organization (RECSO) is based in Dubai. The primary objective of RECSO is to protect the marine resources of member states from oil pollution. The cooperative function on the concept of mutual aid.

RECSO was formed in 1972 by 13 members (Legrenzi & Lawson, 2017). At the time of the formation, the oil companies in the countries felt a need for the protection of the environment from oil pollution.

The concept of mutual aid allows companies to assist countries in cases of oil pollution emergencies. There are also provisions in agreements that allow states and companies to provide reimbursements for damages caused by the oil pollution industry activities (Legrenzi & Lawson, 2017). As stated in the website, the vision of RESCO is to prevent operational oil spills and to ensure a clean gulf.

3.3.4 Council of Arab Ministers Responsible for Environment (CAMRE)

The Council of Arab Ministers Responsible for Environment (CAMRE) is an organization under the League of Arab States. CAMRE has a mandate of issuing decisions regarding the protection of the environment. CAMRE is the policy making arm of the League of Arab States (Freije, 2014). Through CAMRE, the league of Arab states responds to the global environment agenda and policies issued by the UN.

3.3.5 United Nations Environment Programme Regional Office for West Asia (UNEP/ROWA)

The United Nations Environment Programme Regional Office for West Asia (UNEP/ROWA) is a regional organization located in Bahrain. The primary objective of ROWA is to coordinate the regions environmental programs in response to policies and conventions enacted by UNEP (Freije, 2014). ROWA also coordinates environmental activities through private and governmental stakeholders.

3.4 Chapter Summary and Critical Analysis

This chapter highlighted the main regional treaties and agreements surrounding the issues of marine pollution. Although there has been a lot of development in the area of pollution conventions, the desired effectiveness and compliance level is yet to be real-

ized. Although it is difficult to measure the effectiveness of adopted regional conventions, it is important that the agreements contain thresholds that can be used to measure compliance.

The issues of marine pollution from oil still faces Arabian Gulf countries. It is therefore critical that clauses that measure compliance are introduced to the treaties. Today, agreements such as ROPME, PERGSA, and CAMRE lack compliance measurement mechanisms. Because of lacklustre compliance, the Arabian Gulf lags behind regions like the North Sea in terms of marine pollution. Although OILPOL and MARPOL have been instrumental in the protection against marine pollution, it remains to be seen how regional areas translate the benefits to the ground.

To this end, the following chapter makes an in-depth comparison between North Sea and the Arabian Gulf in the context of regional oil pollution prevention efforts. The chapter incorporates a brief analysis of regional agreements and conventions developed to protect the North Sea from runaway oil pollution.

4 Chapter 4: Comparative Analysis of the North Sea and Arabian Gulf

This chapter seeks to conduct a comparative analysis of the regional efforts aimed at preventing oil pollution in the Arabian Gulf and in the North Sea.

4.1 Regional Efforts at the European Union Level

The North Sea is a large water mass lying between Denmark, Norway, Germany, France, Netherlands, and the United Kingdom. The North Sea is quite large compared to the Arabian Gulf. It covers an area of approximately 750,000 km square (Baschek et.al, 2015). The North Sea is one of the busiest sea areas in terms of commercial activities. The area is home to some of the world's largest ports. These include Hamburg, Rotterdam, and Antwerp. The ports provide entry and exit from mainland Europe. For instance, it is estimated that over 270,000 ships went through the main ports in the North Sea in 1999 (Baschek et.al, 2015).

The North Sea has several similarities to the Arabian Gulf, especially in terms of commercial activity and resulting threats posed by intentional and unintentional pollution. Like the Arabian Gulf, the North Sea area is also the primary area for oil and natural gas production since the 1960s (Baschek et.al, 2015). Most oil installations in the North Sea northeast side of the United Kingdom and the southwest part of Norway. European Union report showed there were around 161 oil installations and 326 gas installations in the North Sea (Baschek et.al, 2015). Moreover, dredging and oil extraction activities are conducted in the North Sea region. These include energy generation, fish farming, and mariculture.

Figure 6. The North Sea Region.

Source: (Baschek et.al, 2015).

4.2 Regional Efforts towards Environmental Protection

The North Sea area has a wide range of initiatives aimed at protecting the area from oil pollution. These include protection from oil leakages, oil tanker spills, and leakages

from gas installations. Over the decades, there have been significant developments of the frameworks designed to protect the North Sea from oil pollution. Development of marine protection frameworks has involved treaties, agreements, and conventions (ITOPF, 2002). The first convention aimed at charting a way forward was held at Bremen in 1984. Other conventions include the OSPAR convention, the Bonn Agreement, and conventions stipulated by the International Maritime Organization (IMO) such as MARPOL (IMO, 2001). There have also been measures designed by the European Union to curb activities associated with marine pollution. For instance, there is an existing EU directive on port reception (Baschek et.al, 2015). The directive has significantly reduced the amount of oil pollution caused by port reception activities.

The European Union is also behind the establishment of the European Maritime Safety Agency (EMSA). The primary objective of the agency is to protect the North Sea from pollution that may be caused by operational activities. The agency uses services such as CleanSeaNet (CSN) to monitor pollution activities (Baschek et.al, 2015). The EU has also taken environment protection measures under the auspices the Helsinki Convention. The convention plays a significant role in air surveillance in cooperation with the Bonn Agreement.

4.2.1 Sources of Oil Pollution in the North Sea

Oil pollution entering the North Sea from oil and gas installation has been a primary concern from European countries for a long time. The problem of pollution was first brought to the attention of European governments in the 1960s. In 1967, the North Sea witnessed the Torrey Canyon oil spill. The oil spill led to 119,000 tonnes spill of crude oil (Baschek et.al, 2015). The oil spill worsened due to tides and winds in the North Sea which spread the oil widely and contaminated the beaches in France and United Kingdom. Today, the Torrey Canyon oil spill is still the biggest oil spill in the world. The Torrey Canyon led to the formation of MARPOL in 1973 and the International Convention on Civil Liability for Oil Pollution Damage in 1969 (IMO, 2001).

As discussed above, there are many sources of pollution in the North Sea. Oil entering the marine environment can come from a wide range of sources such as seeps from

underground erosion of sediments, leakages from oil combustion engines, atmospheric deposits from incomplete fuel combustion (Baschek et.al, 2015). The effects of these solutions are known to be disastrous in the long-term. The negative effects of oil spills in these areas are also worsened by the weather conditions in the North Sea such as strong winds, sunlight, and high temperatures. The North Sea also experiences spells of cold weather, which reduces the dispersion speed of oil (Baschek et.al, 2015).

Refined petroleum products and crude oil is also known to enter the waters of the North Sea through accidental oil spills. These products include vegetable oils, fish oils, and animal oils. In 1993, the estimated amount of vegetable oil entering the North Sea was found to be between 7,000 and 15,000 tonnes annually (IMO, 2001)

However, the largest estimated source of pollution in the North Sea was natural seeps that are estimated to be more than 600,000 tonnes a year (Baschek et.al, 2015). Of the 600,000 seeps, researchers estimate that 186,000 tonnes came from oil sludge during routine operations. On the other hand, seeps as a result from the operation of oil tankers are estimated to be about 158,000 tonnes annually (IMO, 2001). Extant research shows that oil spills that are as a result of oil and gas installations account for only 5% of the total oil pollution in the North Sea (Baschek et.al, 2015).

Over the decades there has been a reduced level of pollution in the North Sea. Aerial surveillance conducted under the Bonn agreement shows a sharp reduction in oil spills since the 1980s (IMO, 2001). Data from the Bonn agreement is also consistent with surveillance imagery reported by the EMSA CSN. North Sea states also contribute effectively to monitoring of oil pollution.

4.3 Responding Agreements and Actions

4.3.1 The Bonn Agreement

The Bonn Agreement is an agreement by North Sea states aimed at preventing illegal oil spills. The agreement came into force in 1969 and includes all the North Sea States (Carpenter, 2011). The primary objective of the Bonn Agreement is to protect the

North Sea from oil pollution and accidents. The agreement covers the North Sea, the English Channel, and the Skagerrak. The agreement obligates member states to notify each other in case of oil pollution incidents or accidents (Carpenter, 2011). By signing the agreement, the countries also pledge to assist each other in the event of an oil spill. The Bonn agreement was amended in 1983 and 2001 to include Ireland and all countries under the European Union.

The Bonn agreement has also led to the development of other action plans. These include surveillance plans and accident contingency plans. For instance, in 1978, the UK and France developed MANCHEPLAN. MANCHEPLAN is a contingency plan developed to ensure that countries effectively deal with large-scale maritime disasters (Baschek et.al, 2015). The MANCHEPLAN also contains provisions that can be used to deal with offences committed by countries under agreements such as MARPOL.

Among other things, the Bonn agreement required parties to ensure aerial and satellite surveillance, alert member countries of possible pollution threats, adopt clean-up approaches, support member countries response to threats posed by pollution, and to conduct risk assessments.

4.3.2 The BEWARE project

The BEWARE project of the North Sea was formed under the provisions set by the Bonn Agreement. The purpose of the BEWARE project is to conduct marine pollution risk assessment through a common methodology (Baschek et.al, 2015). Through the BEWARE project, member states get a comprehensive understanding of the risks posed by accidents marine pollution in the North Sea region.

The BEWARE project was a 2 year project that was financed by the European Union and the Bonn agreement secretariat. In the first phase of the project, the methodology developed by BRISK (Sub regional risk of spill of oil and hazardous substances in the Baltic Sea) was used (IMO, 2001). The methodology factored in the key parameters that increase the chances of accidents and pollution. These include ship traffic, the model of oil transportation, number oil installations, and classification of oil.

The model used by the BEWARE project incorporated a wide range of data sources such as cargo data, automatic identification system (AIS) data, and accident data (Baschek et.al, 2015). In particular, the traffic model developed by the BEWARE project was developed using AIS data. The risk posed by oil-tanker collisions was also factored in the model.

4.3.3 Aerial Surveillance Agreements

There have also been wide ranges of bilateral and multilateral agreements that have been established to coordinate aerial surveillance activities. Examples of these agreements are the MANCHEPLAN between France and the United Kingdom, the DenGerNeth plan between Denmark, Germany and the Netherlands, and the NORBRITPLAN between Norway and the United Kingdom (Spellman, 2017). Surveillance programs are usually conducted in a periodic and random manner.

Aerial surveillance agreement is also conducted under the Coordinated Extended Pollution Control Operation (CEPCO) (Spellman, 2017). Under the agreement, countries conduct periodic technical surveillance exercises and then conduct workshops to share findings. The participating countries then draft reports.

4.3.4 The European Maritime Safety Agency (EMSA) and CleanSeaNet Activities

Oil pollution prevention activities in the North Sea area are also coordinated under the European Maritime Safety Agency (EMSA). The European Maritime Safety Agency (EMSA) is the main body that facilitates coordination of environmental protection activities between countries in the European Union. The CleanSeaNet activities are also conducted under EMSA (Al Fartoosi, 2013).

The European Maritime Safety Agency was established in the year 2002 and is based in Lisbon. The agency was formed after the accident of the Erika tanker in December 1999 (Carpenter, 2011). The agency has two main measures the Erika 1 and Erika 2 measures. Both measures contain directives for information management, activity

monitoring, and traffic control. The agency provides member states with technical expertise on the different factors that contribute to marine oil pollution.

EMSA structure includes an office of the Executive director whose responsibility is the organization and preparation of the programme of the agency. The main role of EMSA is to research and issue directives to member countries on the wide range of issues contributing to oil pollution. For example, the agency issued a directive in 2000 that required European Union states to set up port reception facilities (Carpenter, 2011). Given that 20% of the oil spills are as a result of oil operational activities, the directive led to significant reduction of oil spills (Al Fartoosi, 2013). EMSA also coordinates the activities of the Integrated Maritime Policy (IMP). The IMP ensures cooperation during policy development.

4.4 Comparative Analysis: Arabian Gulf and North Sea environment pollution activities

There are a lot of similarities in the way pollution prevention efforts are conducted in the North Sea and in the Arabian Gulf. In the early stages of oil pollution in the Arabian Gulf, most regional prevention activities were modelled from prevention activities in the North Sea (Al-Azab, 2005). This is mainly because of the involvement of Britain in the early stages of oil extraction in the Arabian Gulf. In later years however, there has been a policy divergence in the way authorities in Arabian Gulf deal with marine pollution.

One of the most notable differences between North Sea countries and Arabian Gulf countries is the level of cooperation. It can be argued that the cooperation level in the North Sea is better compared to cooperation in the Arabian Gulf. Since the discovery of oil in the North Sea, European coastal states recognised the need to cooperate in order to prevent oil pollution.

In as early as 1960s, North Sea coastal and Flag states began initiating policies to protect the North Sea area from pollution. According to Carpenter (2018), pollution prevention efforts in the North Sea started late in the 1960s through frameworks such as

international agreements, regional conventions, and education. The formation of the International Convention for the Pollution of the Sea by Oil (OILPOL) of 1954 was one of the earliest efforts by North Sea states in the efforts to prevent marine pollution by oil tankers. OILPOL was followed by conventions such as Bonn Agreement in 1969 and the Oslo convention in 1972 (Carpenter, 2018). The Bonn Agreement in 1969 ushered a period of cooperation in North Sea states that is still visible today. The agreement pioneered surveillance and monitoring efforts that has helped to prevent oil pollution in the region. According to Carpenter (2018), surveillance data provided by the Bonn Agreement is used to identify pollution trends in the North Sea region and in specific countries.

Cooperation is also evident from the formation of the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR). OSPAR was established in 1972 (Al Fartoosi, 2013). The countries in the North Sea also pushed for the development of MARPOL (IMO, 2001). In the Arabian Gulf, countries were reluctant to enter into international agreements.

Unlike pollution prevention efforts in the Arabian Gulf, prevention efforts in the North Sea have been successful. According to Carpenter (2018), most of the objectives set out in the 1984 International Conference on the Protection of the North Sea have been achieved. These include a regional ban on waste incineration and dumping, ban on dumping by offshore installations, and cessation of hazardous substance dumping. The success of pollution prevention efforts in the North Sea can be attributed to several factors. High levels of cooperation, frequent meetings between states, political commitments, and willingness of member states ministers to participate in anti-pollution efforts, advocacy from NGOs, and comprehensive plans (Carpenter, 2018).

However, the same cannot be said about countries in the Arabian Gulf. Reports by researchers like Al-Azab (2005) show a low level of cooperation between countries party to conventions and agreements. There is also a difference between North Sea and Arabian Gulf countries in terms of source of pollution. One of the biggest historical sources of pollution in the Arabian Gulf is intentional pollution caused by wars. For

example, the Gulf war between 1990 and 1991is one of the biggest sources of pollution, the Gulf War oil spill which occurred in 1991 (Alzahrani & Alqasmi, 2013). The inherent conflict in the region adds to the difficulty in cooperation between different states in efforts to prevent oil pollution.

5 Chapter 5: SDG 14 and Transboundary Pollution

The comparative analysis conducted in the preceding chapters illustrate the importance of international treaties in safeguarding against oil pollution. From the developments of international maritime law in the North Sea and the Arabian Gulf, it can be concluded that there has been a commendable level of progress made in the efforts to protect the Oceans from oil pollution. The level of progress in development of international law can be particularly attributed to cooperation and globalization.

5.1 SDGs and their Objectives

The SDGs are a set of 17 goals developed by the United Nations General Assembly. Developed in the year 2015, countries hope to achieve the goals by the year 2030. The 17 targets are also interdependent. The 17 goals and 169 targets represent the objective of global leaders in eradicating some of the biggest challenges facing the world today such as poverty, global health, pollution, and sustainable use of energy among others (Le Blanc, Freire, & Vierros, 2017). The SDGs were also designed to accomplish the unfulfilled objectives of the millennium development goals. Below is a complete set of the 17 SDG goals.

Figure 7. Summary of SDGs

Source: (UNESCO, 2019)

All the 17 goals are characterised by an objective that is directly associated with the environment and the global social structure. Most debates around the world today specifically target the achievement of SDGs. All the 17 goals and the 169 targets are designed to work synergistically in the effort towards redirecting humanity towards sustainable development (Le Blanc, Freire, & Vierros, 2017).

Almost every expert views the SDGs as an appeal from the United Nations to all countries in the world to deal with all the challenges facing humanity. The primary role of the SDGs is to create a world where life can thrive in a sustainable manner. Global leaders hope to achieve sustainability through eliminating key issues facing the world such as natural resource depletion, poverty, income inequality, and global health threats (Le Blanc, Freire, & Vierros, 2017). According to those leaders, this can be achieved the goals set by the SDGs through public and private partnership and an international spirit of solidarity.

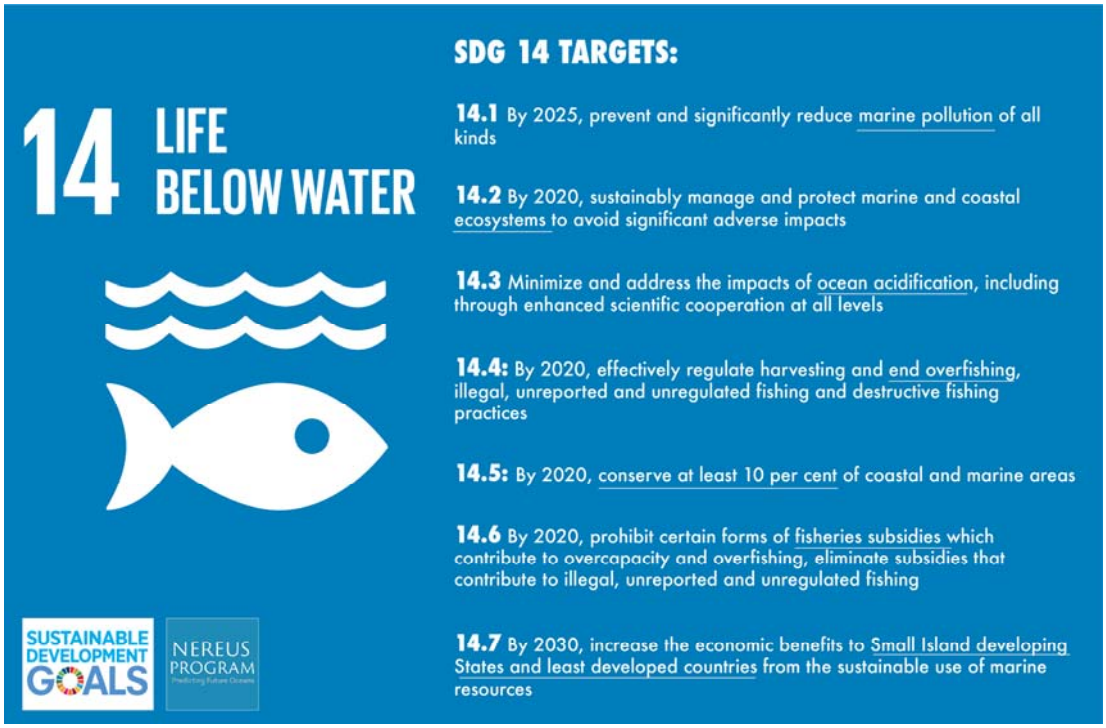
In particular, the SDGs are based on the concept of "Sustainable Development". In the context of the SDGs, sustainable development refers to an approach to development that achieves the present needs of communities without compromising the capability of the next generations in meeting their unique needs (Le Blanc, Freire, & Vierros, 2017). Sustainable development allows global leaders to balance development with social wellbeing, economic growth, and care for the environment.

5.2 SDG 14 and it's Targets

SDG consists of 10 interdependent targets. Relevant to this research, three of the 10 targets directly refer to the protection of Oceans and Marine ecosystems. These are target 14.2, 14.4 and 14.5. Moreover, target 14.1 and 14.3 respectively focus on pollution and prevention of ocean acidification (Le Blanc, Freire, & Vierros, 2017). Out of the 10, three targets refer to the protection of the economic activities surrounding Oceans. These include small-scale artisan fishing and the development of Small Island Developing States (SIDS).

SDG 14 also contains sub target 14 a. and 14 c. Section 14.a targets the sharing and transfer of technology and scientific knowledge. 14.c targets the implementation of UNCLOS. Most of the targets outlined in 14.c were adapted from other international environmental legislation. For example, the objectives outlined in section 14.4 which target the fisheries sector is adapted from the Johannesburg Plan of Implementation. Similarly, the Aichi Targets were used to set the targets in section 14.5.

Figure 8. SDG 14, Life below Water



Source: (Sustainable Development Goals, 2015)

It can be argued that the achievement of some targets may have a ripple effect on the achievement of other targets. However, the effect may be positive or negative. For example, target 14.2 affects target 14.4 and 14.7

The target 14.c targets the protection of Oceans as envisioned in UNCLOS. In particular, International cooperation, as envisioned by UNCLOS, is the primary factor that led to the formulation of SDG 14 targets. The development of SDG and the geopolitics surrounding climate change has led to an era where states are cognizant to the harmful

effects of oil pollution. Indeed, countries have realised the adverse economic and social impacts of oil pollution. According to Noone et.al (2012), oil pollution is threatening the existence of coastal communities.

5.3 Role of SDG 14 in Environmental Pollution

The most important aspect of SDG 14 is that it provides SMART (Specific, Measurable, Attainable, Relevant, and Time bound) goals for effective monitoring and management of pollution prevention goals. The targets are clear and quantitative which can help in the attainment of the goals. Researchers like Takano (2017) view SDG 14 targets and indicators as macroeconomic frameworks that can be aligned with regional legal and budgeting processes. SDG 14 recognizes the existence of trans-boundary considerations that are critical in the prevention of marine

Goal 14 of the SDG by the UN strongly emphasizes on the need to prevent environmental pollution. In particular, SDG 14 outlines a wide range of measures that countries can use to achieve sustainable use of environmental resources (Takano, 2017). The goal outlines ways that can be used to balance economic activities such as oil extraction and adequate use of the environment. According to the convention, over extraction of natural resources has a negative impact on the marine environment (Le Blanc, Freire, & Vierros, 2017).

The seven targets of SGD 14 calls for the interactions between and among people and the environment. Regions rich in oil are also protected under the broad dimensions of Ocean governance. To date, different conventions and agreements have underscored the importance of SDG 14 and the risks associated with over-exploitation of natural resources (Le Blanc, Freire, & Vierros, 2017). It is clear that all resource-endowed countries can benefit from proper maintenance of marine resources.

Other than serving as a quantitative target for states, the goals outlined in SDG 14 can be used to foster cooperation and to inspire best practices in the prevention against accidental and non-accidental oil pollution.

5.4 Synergetic Linkages between SGD 14 and SDG 17

As discussed above, there exists significant interrelationship among the different Sustainable Development Goals (SDGs). In particular, SDG 17 outlines the means of implementation of all the SDGs (Houghton, 2014). These include aspects such as capacity building, partnership, monitoring and accountability, and financing. In particular, partnerships and cooperation has been identified as one of the most important factors that can expedite the accomplishment of SDG 14.

SDG 17 targets partnerships and cooperation among states that can positively influence the accomplishment of all the SDG goals. Relevant to this research, SDG 17 envisages a situation where international partnership facilitates mobilization, sharing of resources, and knowledge promotion that boosts environmental protection activities (Houghton, 2014). Give the transboundary nature of today's pollution activities, there is a concerted efforts by bodies like the UN to grow cooperation among regional and international states.

Figure 9. Goal 17 of the SDGs

Source: (Sustainable Development Goals, 2015)

5.5 Linkages between SGD 14, SDG 17 and Extant Transboundary Pollution

One of the most notable impacts of the SDGs is the increase in collaboration between states in efforts against oil pollution, especially SDG 14 and SDG 17. In particular, SDG 14c envisions a high level of cooperation between states in their realization of the goals set by UNCLOS. Important to note that targets like the SDG 14 are having an immense positive impact on international transboundary law (Houghton, 2014). The old years where conventions and agreements would only be used for relations is waning fast. Today, international maritime law is multi-layered and structured, with provisions for redress in case of transboundary pollution. As witnessed from regional cooperation in the Arabian Gulf and the North Sea, states have been today compelled to institute tailored regulatory approaches that to contain any form of oil pollution.

It can be argued that the motivation behind the establishment of the SDG 14 can be channelled to address the problem of trans-boundary pollution. Due to the heightened level of oil activities in the Arabian Gulf and increased occurrence of trans-boundary pollution, it is critical that this paper points out the different ways that possible cases of pollution can be tackled by regional regulations and conventions (Houghton, 2014). First, this paper gives a background of SDG 14, accidental and non-accidental pollution and discusses trans-boundary movement of oil spills. Technically, the targets set by SDG 14 should safeguard against oil pollution. However, it is still unclear how regional bodies such as the GCC can effectively use such goals to prevent oil pollution.

Oil pollution in international waters is known to transcend international borders. As such, different conventions include provisions that can be used to tackle trans-boundary pollution. Oil extraction in deep seas between international boundaries is known to cause trans-boundary pollution (Sosa-Nunez, 2017). Trans-boundary pollution therefore, occurs when oil spills in the waters of one specific country and moves from that country and causes damages in a bordering country. Trans-boundary oil is a common source of international disputes since oil spills from one country can cause ecosystem degradation inside the borders of a different country (Sosa-Nunez, 2017).

Trans-boundary movement of oil spills has specific legal implications in international environmental law. Today laws relating to trans-boundary movement of oil spills are not only preventive but also punitive (Vikas & Dwarakish, 2015). The laws stipulate punitive measures that can be directed to countries that cause trans-boundary movement of oil spills.

5.5.1 Trans-boundary pollution in Accidental and Non-accidental oil pollution

Although oil pollution is often regarded to be a regional problem, it has global consequences. There are three key aspects of oil pollution that require international cooperation as envisaged in SDG 14 in conjunction with SDG 17. One key aspect of international oil pollution that requires cooperation is the long-range effect of pollution from one country to another. Second, as discussed above, it can be argued that the

knowledge of the effect of oil pollution in one region can be transferred to another. For instance, similar oil pollution challenges face countries in the North Sea and the Arabian Gulf. Third, implications of policy developed in one country or region on countries in other regions. Therefore, this dissertation argues that international cooperation is critical in the efforts towards prevention of marine pollution.

As discussed in previous chapters, maritime accidents have previously challenged the effectiveness of regional and international law. In particular, risks of trans-boundary has been found to be higher in the Arabian Gulf and the North Sea. Researchers like Al Fartoosi (2013) have pointed out the ineffectiveness of the laws in dealing with trans-boundary oil spills.

Accidental and non-accidental oil pollution is usually the result of the activities of oil companies. Oil companies face a wide range of challenges during extraction and transportation of oil. The complexities involved in these activities make it very difficult to monitor and manage oil pollution activities. Oil spills in Oceans can either be intentional or accidental. Accidental oil pollution occurs as a result of mechanical or human errors and is beyond the control of humans. On the other hand, intentional or non-accidental experts occur as a result of sabotage and are a result of deliberate plans to pollute the environment. An example of intentional oil pollution is the pollution during the Gulf War.

Extant research shows that accidental oil spills can be significantly reduced by applying proper engineering techniques in oil tankers and other oil transportation devices (IMO, 2001). Today, oil companies also use automatic identification systems. Such systems are used to monitor the condition of underground oil pipelines. According to UNCLOS, flag states and coastal states are responsible in instituting measures that prevent accidental oil spills (Al Fartoosi, 2013). Intentional pollution is also prohibited under provisions of MARPO 73/78.

The current dissertation argues that a high level of regional and international cooperation is required to address the challenges presented by oil pollution, whether at a regional or international level. As envisioned by SGD 17 and SDG 14, countries need to

collaborate both at a scientific and policy level (Le Blanc, Freire, & Vierros, 2017). These include development of agreement and conventions that increase synergies and alignment with SDG 14.

The benefits of cooperation have been recognized in other areas of pollution like trans-boundary air pollution. Through convention such as UNECE Convention on Long-range Transboundary Air Pollution, global leaders cooperate on a regional basis to tackle the problems of air pollution (Le Blanc, Freire, & Vierros, 2017). It is therefore critical for countries to cooperate on a regional basis in the fight against oil pollution.

6 Chapter 6: Conclusions and Recommendations

6.1 Conclusions

The last few decades have witnessed a commendable level of regional cooperation and adoption of international environmental law by countries in the Arabian Gulf. Since the initial establishment of the Stockholm Conference on the Human Environment in 1972, different regional states have taken proactive steps to enact preventive measures against environmental damage. As discussed above, Arabian Gulf states have not been left behind in the development of regional laws that reflect international environmental laws.

However, marine pollution at the Arabian Gulf has been a subject of widespread international and regional concern. As discussed in this research, most of the cases of pollution are preventable. From the completed fundamental analysis, it is clear that regional and international conventions have the potential of significantly reducing the occurrence of pollution activities. This research has established that the strength of the use of international agreements can be derived from implementation of regional agreements that are aligned with international agreements.

One key objective of this paper was to conduct a comparative analysis between marine pollution occurrences in the Arabian Gulf and in the North Sea. From this analysis, this paper determined that the Arabian Gulf lags behind in terms of regional cooperation and partnerships. Although the objective of the regional treaties in the Arabian Gulf and the North Sea are similar, the countries in these regions have varying levels of commitment towards the achievement of the agreements. It is therefore critical for regional governments to devise strategies for partnerships as an important part of regional agreements.

This research found that international and regional partnership was one of the main factor behind the establishment of both UNCLOS and SDG 14. In fact, SDG 17 lays

out mechanism for countries to partner towards the achievement of regional and international objectives. Unfortunately, it can be argued that the lack of close cooperation between countries in the Arabian Gulf created major obstacles in the achievement of regional and international conventions. To prevent such issues in the future, regional bodies like the GCC should prioritize cooperation and partnerships as key strategies in the prevention of marine pollution. Specifically, the outcomes of this research point to the importance of cooperation and partnerships as outline by both UNCLOS and the SDGs.

The comparative analysis of the laws of the North Sea and Arabian Gulf shows the effect of globalization on international law. Traditional environmental laws such as MARPOL 73/78 that focus on relations between countries are fast being boosted by new multi-layered conventions and agreements such as SDG 14. Most regional states today are undertaking multi-layered approaches that borrow from international environmental law. These conventions have a wide range of objectives such as increasing surveillance and conducting risk assessment on pollution activities.

Today, regional cooperation on matters relating to oil pollution has become a basic yet critical part of international law. Despite the existence of widely known international environmental initiatives such as SDG 14, it can be argued that the success of international law is dependent on the success of regional instruments designed to curb marine pollution. As analysed above, the success of international conventions is also dependent on the values of the countries in question.

To this end, this thesis has fulfilled the laid out research objectives by extensively analysing the issue of marine pollution and outlining possible solutions. The issues of marine pollution are not new; it has been previously tackled by other scholars. However, very few literature sets have conducted a comparative analysis of the effectiveness of regional agreements and conventions. Moreover, aspects of marine pollution such as international civil liability are relatively new. The comparative analysis and the discussion of the role of UNCLOS and the SDGs provides a good background for future research.

By highlighting the inefficiencies of the regional conventions, this research has brought into focus extant gaps in the implementation of regional conventions and international law in general. This thesis therefore provides a theoretical basis for the discussion and development of agreements that seek to address this gap. This thesis also provided insights of the state of transboundary pollution. As discussed, international conventions and agreements provide a strong legal basis for preventing occurrences and in dealing with the effects of transboundary pollution.

Overall, it is clear that negotiations between countries on matters regarding marine pollution will continue in the future under the umbrella of international law. Like it has happened in historical times, it is expected that more cases of marine oil spills will occur which will force states to design and implement more cooperative measures. These treaties will only be effective if they are implemented in a coordinated approach by all affected states.

Moreover, this research has exposed two challenges associated with the fight against marine pollution. These include challenges associated with pollution contingency planning and challenges associated with rising cultural awareness.

6.1.1 Challenges Associated with Pollution Contingency Planning

Although accidental oil pollution is unpredictable in nature, research shows that accidental oil spills can be predicted and minimized. The effects of oil spills can also be minimized through effective and well-planned responses. According to UNCLOS, the key objectives of oil spill contingency plans should be to reduce, control, and minimize the effects of environmental oil spills. Different parties that respond to oil spill emergencies also design oil spill contingency plans to coordinate spill containment efforts.

The agreement by Arabian Gulf countries under ROPME requires states to establish emergency response coordination centres that facilitate fast and reliable communication (Al Fartoosi, 2013). To minimize the damage caused by disasters, there should be facilities ready to be used for coordination and exchange of information in different

countries. These facilities should relay information such as weather conditions that can affect oil spill response efforts.

Contingency planning can be significantly boosted by cooperation and partnerships between states. Through close cooperation, member states can constantly be updated about the status of the contingency plan. Cooperation between countries can be at the ministerial level of the countries. In this context, ministries of different countries co-ordinate and cooperate in different initiatives.

The effectiveness of contingency planning can also be boosted by regular regional meetings. Such meetings can facilitate assessment of the effectiveness of the set laws in curbing marine pollution. Proper adjustments to regional conventions and laws should be made in cases where the regulations are ineffective. Apart from preventing the occurrence of pollution, these measures will reduce the damage of marine pollution when it occurs.

6.1.2 Challenges Associated with Raising Cultural Awareness

One of the biggest hurdles encountered in the alignment of regional legislation with international laws is the inherent cultural difference. It is therefore, important for regional governments to raise the level of cultural awareness of the effects of environmental pollution. Apart from reducing public environmental pollution, awareness will increase the participation of citizens in legislation aimed at reducing the effects of all forms of pollution. Cultural awareness of the effects of marine pollution can be improved through the school curriculum or through educational TV programs.

Although UNCLOS and SDG 14 say nothing about cultural awareness, the importance of cultural awareness is integral to the core value of the United Nations. In particular, multiple conventions and resolutions by UN Conference on the Ocean have underscored the importance of cultural awareness in raising awareness of the role of the oceans in the world. The awareness of the importance of marine conservation can significantly boost the effectiveness of agreements and conventions in the Arabian Gulf.

6.2 Recommendations

Through international conventions and agreements like ROPME, UNCLOS, and the SDGs, countries in the Arabian Gulf have a responsibility of creating initiatives for joint action and collaboration for the achievement of marine prevention objectives. This thesis asserts that coordination and collaboration is critical for effective and efficient achievement of pollution prevention objectives. For example, the role of the state with port authority as outlined by IMO should be adhered to. It is also important for states to understand that the Arabian Gulf stands on a fragile ecosystem therefore, any dumping activities should be prevented.

Since the first case of oil pollution in middle of the twentieth century, global leaders have been looking for a permanent solution. Marine pollution causes devastating effect to the ocean environment and surrounding ecosystems. Previous studies conducted in the Arabian Gulf shows that the area faces pollution from different unrelated sources. However, there is a general agreement that the primary source of pollution is oil pollution. By conducting a comparative analysis between the North Sea and the Arabian Gulf shows that it is critical for local laws to be adopted in alignment with International Environmental Law. Regional states should therefore increase their awareness in international laws and conventions such as SDG 14.

This thesis has analysed the dominant issues surrounding international and regional oil pollution. The paper has outlined the background of the problem and its relevance in today's maritime environment. In furtherance of the foregoing the following actions are recommended:

1. Close cooperation between flag states and coastal states on issues involving marine pollution. From the analysis of the North Sea region, this thesis has demonstrated that cooperation can boost adherence to regional and international conventions. Cooperation, as outlined in SDG 17, would also decrease the likelihood of regional wars.

2. This thesis also recognizes the importance of international conventions in furthering the efforts of preventing regional marine oil pollution. Indeed, major international conventions like MARPOL and UNCLOS have become models for regional conventions. This shows that the conventions work. They should therefore be completely adopted by regional states.

3. Lastly, this thesis calls for urgent implementation of pollution prevention measures. Some of the measures that can be implemented are local oil spill contingency planning and cultural awareness of the impact of oil pollution.

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